

A Sensitive Subject

Sensing the benefits of sensory integration therapy

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Interaction between the brain and the senses is crucial to harmonious living. But miscommunication between stimuli and the brain's response may trigger extreme reactions that interfere with daily tasks. Sensory integration therapy aims to link sensory networks and have the brain and senses work in accord.

Pioneered by renowned researcher A. Jean Ayres, PhD, OTR, in the 1950s – and illustrated in her groundbreaking book, *Sensory Integration and Learning Disabilities* (Western Psychological Services, 1972) – sensory integration (SI) therapy seeks to encourage the nervous system to integrate sensory information in an organized manner. Utilizing various tools, therapists seek to enhance the ability of the nervous system – and correlating behaviors – to function more effectively.

“Sensory integration therapy builds a foundation for higher level tasks by filling in missing foundations that are sensory,” notes Lucy Jane Miller, PhD, OTR. A driving force in the ongoing research into SPD and SI therapy, Miller, a protégé of Ayres, serves as director of the Denver-based Sensory Therapies and Research (STAR) Center. An associate clinical professor at the University of Colorado, Miller recently authored *Sensational Kids: Hope and Help for Children with Sensory Processing Disorder*. (Putnam Adult, 2006)

While employed for stroke patients, those with ADHD or autism spectrum disorders, SI therapy is perhaps most often associated with Sensory Processing Disorder (SPD), a complex neurological disorder wherein children may have difficulty modulating or adapting to sensation.

Signs of the disorder include: being overly sensitive to touch, movements, sights or sounds; having an unusually high/low activity level; coordination problems and poor organizational behavior; delays in academic achievement and low self esteem.

There are different types of SPD, each with a different set of responses and behaviors. Some children may be overly-sensitive to touch while other may crave sensation, resulting in hyperactivity.

Along with five basic senses – sight, sound, taste, touch and smell – two so-called hidden senses also offer sensory input. The vestibular sense signals where our body is in space and the proprioceptive indicates pressure in the muscles and joints. Most children with SPD have poor vestibular and proprioceptive perceptions, Miller says.

During SI therapy, the therapist – typically an OT, speech or physical therapist – gauges a patient's response in increments, gradually adjusting the amount of stimuli. The therapist literally decides the treatment on a minute-to-minute basis. The goal is satisfy the absent sensory communication, ultimately teaching the child how to self regulate. Calming activities help to teach how to avoid over arousal while other techniques draw out patients with a lower response to stimuli.

According to Dillen Hartley, OT, an occupational therapist with Advanced Therapy Solutions in Spartanburg, S.C., the goal for a therapist utilizing SI is to create an environment or platform where patients can be exposed to the sensory network they lack.

“The trick is, to quote Dr. Ayres, finding that ‘just-right activity’ and manipulating the experience to achieve success,” Hartley says.

To illustrate the point, Miller compares the senses to a house's foundation, with higher level tasks such as learning, memory, thinking, sleeping serving as the roof of the house. SI therapy builds a ladder, allowing all the senses to work together effectively in order to attain such higher level tasks.

“It's not a simple issue like, ‘There's a tactile problem, let's use tactile stimulation,’” Miller says. “The question is, ‘How can I use the vestibular sense to decrease his arousal?’”

Whether it's using tools such as swings, sand, balls, ropes, puzzles or other stimuli, a therapist must work with the patient's internal modulators, gradually increasing their tolerance to the sensation, Hartley says.

As such, a child over-responsive to sensory input, for example, may benefit from steadily being exposed to tactile sensation, among other exercises. Once the child is able to regulate a response, behaviors such as crying when exposed to bright lights or unexpected noise may cease. They may be more tolerant of textures, such as clothing or carpet. Ultimately, the child may gain self esteem, leading to increased social interaction.

However, it's important to note that in order for SI therapy to occur, there has to be an active response from a child. "It can't be passive." Miller says. "It has to be individualized, different for each child."

"What we've discovered is that parents are struggling to find products to help their children," notes Jeffery Barnett, president of the Fort Collins, Colo.- based Benchmark Learning Products, whose wares are sold in therapeutic catalogs. "What works for one child may not work for another."

Barnett's Delta Sand product, for example, is dry but acts like wet sand. It offers various levels of resistance and can be molded, providing tactile stimulation. "How therapists use it is totally up to them," Barnett says.

Interactive Metronome, in Weston, Fla., offers therapists a device that challenges patients to synchronize hand and foot movement to a computer generated reference beat, assessing a patient's motor planning and sequencing ability.

Accordingly, therapists can then measure the patient's response to the millisecond to see whether it falls into the normative or impaired range. Once the measurement is made, the therapist can then begin improving that functional foundation, says Interactive Metronome's vice president, Al Guerra.

"On a basic neurological level it uses repetition, but you're improving the brain's efficiency and performance," he says. "Neurologically, you're building the foundation for more complicated tasks."

While SI therapy is enjoying a renaissance of sorts thanks to increased research and expanded base knowledge, Miller observes there's still much to be done. Funding for SPD research and, thus, SI therapy, remains a constant battle.

Miller is also passionate in her pursuit to include SPD in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Publishing, 2000), or, at a minimum, in its appendix. Still, progress is being made. Recent electroencephalography (EEG) studies demonstrated what's happening in the brain of SPD patients and further research could lead to more effective SI treatments.

In the meantime, Miller advises therapists interested in SI to seek out master or expert clinicians in schools or clinics around the country, to gain one-on-one mentoring. Therapists may also become certified in Ayres' testing procedure, she notes. As the knowledge base increases, Miller predicts more children will be diagnosed with SPD, with more parents seeking SI treatment.

"If you lose your self esteem by the time you're in second grade, what kind of future do you have?" she questions. "The younger we can find them, the more good we can do. It's exciting, though. It's a happy field to work in. We're making a difference in families' lives."

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